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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

1462-P02748US0

U.S. APPLICATION NO. (If known, see 37 CFR 1.3

10/009181

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/KR00/00485

18 May 2000

18 June 1999

TITLE OF INVENTION

**AUTOMATIC PAGE TURNING-OVER APPARATUS FOR BOUND PAPERS**

APPLICANT(S) FOR DO/EO/US

HA, Young-Kyun

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

Copy of Form PCT/IB/308 (1996)

21. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO. .... \$1040.00International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$740.00International preliminary examination fee (37 CFR 1.482) paid to USPTO  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$710.00International preliminary examination fee (37 CFR 1.482) paid to USPTO  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS PTO USE ONLY**

\$ 1,040

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 130

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$
Total claims	3 - 20 =	0	x \$18.00	\$ -0-
Independent claims	2 - 3 =	0	x \$84.00	\$ -0-
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	\$ -0-

**TOTAL OF ABOVE CALCULATIONS =**

\$ 1,170

☒ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above  
are reduced by 1/2.

\$ 585

**SUBTOTAL =**

\$ 585

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ -0-

**TOTAL NATIONAL FEE =**

\$ 585

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ -0-

**TOTAL FEES ENCLOSED =**

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- a. ☒ A check in the amount of \$ 585.00 to cover the above fees is enclosed.
- b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 04-1406. A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card  
information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR  
1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

JOHN B. BERRYHILL

NAME

36,452

REGISTRATION NUMBER

PTO/PCT Rec'd 07 DEC 2001

**AUTOMATIC PAGE TURNING-OVER APPARATUS FOR BOUND PAPERS****Technical Field**

The present invention relates to an automatic page turning-over device, and more particularly to an automatic paper turning-over device adapted to an image scanning device such as a scanner or an auto duplicator and the like, which turns over a sheet of a bound document automatically to scan an image thereof.

**Background Art**

Generally, an image scanning device such as a scanner or a auto duplicator and the like comprises an image scanning section for obtaining an image information, a driving section for driving the image scanning section, an image treating section for treating the scanned image information, a control circuit section having a microprocessor for controlling the above sections, and a driving portion for output of the image information.

Such prior image scanning device could scan only to one sheet in such a way that when scanned, the steps of placing a sheet on the glass plate, image scanning the sheet by pressing an image scanning key, and repeating the above steps for a next sheet may be carried out. Also, to image-scan a document which is bound like a book, or has sheets bonded on its one side by a binder, the steps of turning over the one side of the sheet to image scan the same, and turning over again the other side of the sheets to image scan the same should be carried out. Thus, to image scan the document consisting of, for example, more than fifty sheets, more than fifty working steps should be carried out while pressing an image scanning key as well.

Like this, since the prior sheet-turning over device should image scan the document only by a sheet, there is an inconvenience with an image scanning process. Also, the turning over steps should be repeated  
5 continuously, thereby causing an operator to feel fatigue, a reduction of operational accuracy and speed, and an eventually reduced working efficiency.

#### Disclosure of the Invention

Therefore, an object of the invention is to resolve the above problem and to provide an automatic paper turning-over device which can be adapted to the image scanning device, and needs not to manually turn over the bound document by a sheet for scanning the same, thereby obtaining the convenient scanning work,  
10 and since the bound document is turned over and scanned automatically, a time required for image scanning of the bound document is reduced as well as a working accuracy and a working speed are improved, thus to obtain an efficient scanning and a reduced labor.

To accomplish the object, the present invention provides an automatic paper turning-over device for a bound document adapted to an image scanning device which scans and treats an image information of the sheet, and obtains a desired image from the treated image  
20 information, the automatic paper turning-over device comprising a transparent member consisting of a transparent material such as a glass plate; a lifting means for the bound document, having a supporting member, which is rotatable about a pivot member at  
25 predetermined angle, for vertically lifting and descending a binding portion of the bound document spread out opposite to the transparent member by a cylinder portion while supporting the binding portion, and an elastic piece mounted on the lower portion of the  
30

supporting member for damping a pressure to the transparent member; a pressing means having a pressing piece for pushing up the opposite sides of the binding portion of the bound document while being lifted and descended so that a scanning face of the bound document may be in closely contact with the transparent member, an elastic piece mounted coaxially with the pressing piece, and a cylinder portion for lifting and descending the pressing piece and the elastic piece; a sheet-turning over means having a sheet-lifting section mounted to lift the scanned out sheet about the bound document, and a sheet-turning over portion for reciprocating a turning over bar in the space defined by the sheet-lifting section to turn over the sheet; and a controller for controlling a series of lifting, pressing and sheet-turning over processes of the bound document.

Preferably, a balance weight is mounted on both sides of the supporting member 22 to promote a rotation of the supporting member.

Preferably, the sheet-lifting section comprises any one of the following portions consisting of a suction portion for sucking the sheet using a vacuum or an electrostatic force, and a roller portion for lifting the sheet using a friction between the sheet and the outer periphery thereof.

In accordance with the above-mentioned construction, there is provided an auto sheet-turning over device which can be adapted to the image scanning device, and needs not to manually turn over the bound document by a sheet for scanning the same, thereby obtaining the convenient scanning work, and since the bound document is turned over and scanned automatically, a time required for image scanning of the bound document is reduced as well as a working accuracy and a working

speed are improved, thus to obtain an efficient scanning and a reduced labor.

#### Brief Description of the Drawings

The above object, other features and advantages of the present invention will become more apparent by describing the preferred embodiment thereof with reference to the accompanying drawings, in which:

Fig. 1 is a front view illustrating an automatic paper turning-over device according to an embodiment of the present invention;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a schematic view illustrating an operation of the lifting means of Fig. 1;

Fig. 4 is a schematic view illustrating an operation of the lifting means of Fig. 1;

Fig. 5 is a view illustrating a different operational state of Fig. 3; and

Fig. 6 is a schematic view illustrating an operation of the sheet-turning over means of Fig. 1.

#### Best Mode for Carrying Out the Invention

Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings.

According to Fig. 1 and Fig. 2, the present invention provides an automatic paper turning-over device that has a configuration including a housing 11 adapted to an image scanning device such as a scanner or a duplicator etc., on which a transparent member 13 such as a glass plate, etc. is provided, and a door portion capable of opening/closing at the front of the housing, which door portion is not described in drawings. In the housing, it is provided a lifting means 20 for bound document 10, pressing means 30, a sheet-turning over means 40, and a controller 50.

That is, the lifting means 20 for bound document is provided for vertically lifting and descending the bound document 10 supported thereon in the opposite direction of the transparent member 13, so that a center portion of a scanning face may be contacted close to the transparent member 13. The pressing means 30 is provided for supporting and pressing both sides of the bound document 10 so that the entire scanning face thereof may be pressed close to the transparent member 13. The sheet-turning over means 40 is provided for turning up the scanned out sheet of the document. Finally, the controller 50 is provided for controlling the driving of the lifting means 20, pressing means 30 and turning over means 40 with signals from a sensor means which is connected to all of the means respectively and is not described in the drawings.

The lifting means 20 comprises a cylinder portion 21 and a supporting member 22 on which a binding portion of the spread bound document 10 is seated, the supporting member being mounted to the top side of a cylinder rod which is driven by the cylinder portion. A pivot member 23 is mounted on a center axis of the supporting member 22 for allowing a body of the supporting member 22 to be pivoted on at predetermined angle thus to support the center portion of the bound document 10 closely to the transparent member 13. Thus, the supporting member 22 can pivot about the pivot member 23 from side to side and push the binding portion to the transparent member 13 even if the bound document is asymmetrical about the binding portion, so that the center portion of the bound document may be in closely contact with the transparent member 13. Under the supporting member 22, the cylinder rod and an elastic piece 24 are provided, which elastic piece is mounted coaxially with the cylinder rod to damp a pressing force

applied to the bound document for closely contacting with the transparent member 13 in order to prevent the transparent member from being damaged. Further, a balance weight 25 is mounted on opposite sides of the supporting member 22. Since the supporting member 22 should be rotated at about 90° to complete a closely contact of the scanning face with the transparent member 13 when a front portion or a back portion of the bound document is in closely contact with the transparent member 13, the balance weight for example serve to promote a rotation of the supporting member in this case.

The pressing means 30 includes a pressing piece 32 for supporting both faces of the bound document 10 while pressing the same so as to bring the scanning face of the bound document into closely contact with the transparent member 13. The pressing piece is supported by the cylinder rod and vertically lifted or descended by the cylinder portion 31. An elastic piece 33 is provided coaxially with the cylinder rod to damp a pressing force applied to the opposite sides of the bound document 10 so that the transparent member 13 may not be damaged while the pressing force of the pressing piece is applied to.

The sheet turning over means 40 includes a sheet-lifting section 41 for lifting the scanned out sheet to turn over the same in the direction A, and a sheet-turning over section 45 for turning over the sheet lifted by the sheet-lifting section 41 and returning to its original position.

The sheet-lifting section 41 capable of linearly reciprocating is mounted. In the preferred embodiment of the present invention, the sheet-lifting section 41 comprises a suction portion 43 for sucking and lifting the sheet by a vacuum force or an electrostatic force,



and a suction generating portion 44 connected to the suction portion 43. However, a friction device such as for example, a roller portion for lifting the sheet by friction force is able to use as the sheet-lifting means  
5 of the present invention.

The sheet-turning over section 45 has a turning over bar 47 supported by a rail rod 46 and reciprocated thereto, whose body is supported by a gear belt, which is not described in drawings and driven by a driving  
10 section 48, thus to reciprocate with a forward or backward running of the gear belt.

The controller 50 is mounted in such a way that is able to communicate with another external device, thus to control the lifting means 20, pressing means 30 and turning over means 40. That is, the controller 50  
15 controls a driving of the lifting means 20 and the pressing means 30 so as to lift the bound document 10 toward the transparent member 13 thus to bring the bound document into closely contact with the same, and  
20 controls the lifting means 20 and the pressing means 30 to be descended by any signals after the scanning face of the sheet is completely scanned out. In the descended state of the bound document 10, the controller 50 controls the turning over means 40 to be driven to turn  
25 over the sheet, and thereafter controls again the lifting means 20 and the pressing means 30 to be lifted toward the transparent member 13. The controller 50 controls the lifting means 20 and the pressing means 30 to press the bound document 10 with a proper pressure  
30 after receiving a signal for detecting a pressing force applied to the elastic pieces 24 and 33 of the lifting means 20 and the pressing means 30. The controller 50 controls the driving of the lifting means 20 and the pressing means 30 to complete a scanning work and to be  
35 descended toward its original position after receiving a

signal that indicates there be no more sheet to be scanned when the scanning work to the bound document 10 is completed.

5 Now, an operation of the above described automatic paer turning-over device will be explained in detail.

As shown in Fig. 1, the scanning face of the bound document is positioned opposite to the transparent member 13 in a state that the binding portion is seated on the supporting member while the bound document 10 is spread such that the scanning face of the sheet to be initially scanned may be seen. In this case, since the balance weight 20 weighing some weight is mounted on opposite sides of the supporting member 22, even though the first page or the last page of the bound document 10 is scanned, the scanning face will be in closely contact with the transparent member 13 as described in Fig. 1.

In this state, when the scanning device is operates, the controller 50 provides a driving control signal to the lifting means 20. Thereafter, the supporting member 22 is lifted by the driving of the cylinder portion 21 while being supported by the cylinder rod, so that the center portion of the bound document 10 may be in closely contact with the transparent member 13 with a proper pressure. In this case, the elastic piece 24 damps the pressing force of the supporting member generated from a close contact of the bound document 10, so as to prevent the transparent member 13 and the bound document 10 from being damaged by the pressing force of the supporting member. The controller 50 receives a sensing signal indicating the pressing force of the elastic piece 24 and controls the driving of the supporting member 22 in such a way that the supporting member may stop in lifting when the scanning face of the bound document 10 is in closely contact with the transparent member with a predetermined

proper pressure. In this state, the center portion of the bound document 10 is in closely contact with the transparent member 13.

Thereafter, as shown in Fig. 4, the controller 50 provides a driving control signal to the pressing means 30 such that a pressing piece 32 may be lifted by the driving of the cylinder rod of the cylinder portion 31 to support and lift both faces of the bound document 10 dangled outward of the supporting member toward the transparent member 13. Then, the scanning face of the sheet may be in closely contact with the transparent member 13 by a pressing force from the pressing piece 32. Also in this case, the elastic piece 33 mounted coaxially with the pressing piece 32 damps the pressing force of the pressing piece generated from a close contact of both faces of the bound document 10, so as to prevent the transparent member 13 and the bound document 10 from being damaged by the pressing force of the pressing piece 32. The controller 50 receives a sensing signal indicating the pressing force of the elastic piece 33 and controls the driving of the pressing piece 32 in such a way that the pressing piece may stop in lifting when the scanning face of the bound document 10 is in closely contact with the transparent member with a predetermined proper pressure. In this state, both faces of the bound document 10 is in closely contact with the transparent member 13.

Meanwhile, since the binding portion of the bound document 10 is spread out on the supporting member 22 with different thickness during working as shown in Fig. 5, or during initial scanning or final scanning, the binding portion would incline to a thick portion of the document. Simultaneously, the supporting member 22 rotates about the pivot member 23 in the direction a correspondingly to the inclining motion of the binding

portion when the scanning face of the bound document 10 is in closely contact with the transparent member 13, thus to press against the binding portion. Then, the sheet of the bound document 10 is spread out to its center portion to completely closely contact with the transparent member 13. Since the rotation of the supporting member 22 is promoted by the balance weight 25, the bound document 10 keeps in closely contact with the transparent member 13 completely even at its initial portion or final portion.

Thereafter, any image scanning device which is not described in drawings scans the scanning face of the bound document by the control signal, reads and treats the scanning information of the scanned face, and finally obtains a desired image of scanned face.

Then, the controller 50 controls the lifting means to descend the supporting member 22. The controller 50 also descends the pressing piece 32 of the pressing means 30, and when the controller orders a continuous working through a decision whether or not the working ought to be continued, the sheet-turning over means 40 is driven by the control order.

That is, the bound document 10 descended to its original position as shown in Fig. 6, is automatically turned over by the turning over means 40, and the sheet-lifting section 41 received a control signal from the controller 50 carries the suction portion 43 driven by the linearly movable cylinder portion 42 to a right sheet of the drawing. The carried suction portion 43 sucks the sheet and returns to its original position by the controller 50. Then, the scanned out sheet defines a predetermined space between the center portion of the bound document 10 and the scanning face of the next sheet, and at the same time, when the signal for detecting the lifted sheet is transmitted to the

controller 50, the turning over bar 47 is positioned between the center portion of the bound document 10 and the scanning face of the next sheet, and interlocked by one-way gear belt run by the driving portion 48, thus to move in the left side of the rail rod 46. Then, the lifted sheet is turned over the turning bar 47 in the left side, and the bar returns to its original position.

The scanning is carried out by repeating the those processes, and when the controller 50 receives a signal for indicating no sheet exists, and orders a discontinuance of working, the bound document 10 is discharged from the housing 11.

Therefore, it is not necessary to scan a document like a book required to be scanned while turning over the same by a sheet, and many advantages will be obtained correspondingly, when such auto sheet-turning over device is adapted to the image scanning device such as a scanner or a duplicator.

While the present invention has been described herein with reference to particular embodiments thereof, a latitude of modification, various changes and substitutions are intended in the foregoing disclosure, and in some instances some features of the invention will be employed without a corresponding use of other features without departing from the scope of the invention as set forth.

#### **Industrial Applicability**

As apparent from the above description, the automatic paper turning-over device of the present invention can be adapted to the image scanning device such as a scanner or a duplicator. The automatic paper turning-over device of the present invention has many advantages in that an operator needs not to manually turn over the bound document by a sheet for scanning the

same, thereby obtaining the convenient scanning work,  
and since the bound document is turned over and scanned  
automatically, a time required for image scanning of the  
bound document is reduced as well as a working accuracy  
5 and a working speed are improved, thus to obtain an  
efficient scanning and a reduced labor.

10009184 032202

### Claims

1. An automatic paper turning-over device for a bound document adapted to an image scanning device which scans and treats an image information of the sheet, and obtains a desired image from the treated image information, the auto sheet-turning over device comprising:

a transparent member 13 consisting of a transparent material such as a glass plate;

a lifting means 20 for the bound document, having a supporting member 22, which is rotatable about a pivot member 23 at predetermined angle, for vertically lifting and descending a binding portion of the bound document spread out opposite to the transparent member 13 by a cylinder portion 21 while supporting the binding portion, and an elastic piece 24 mounted on the lower portion of the supporting member 22 for damping a pressure to the transparent member 13;

a pressing means 30 having a pressing piece 32 for pushing up the opposite sides of the binding portion of the bound document 10 while being lifted and descended so that a scanning face of the bound document may be in closely contact with the transparent member 13, an elastic piece 33 mounted coaxially with the pressing piece 32, and a cylinder portion 31 for lifting and descending the pressing piece 32 and the elastic piece 33;

a sheet-turning over means 40 having a sheet-lifting section 41 mounted to lift the scanned out sheet about the bound document 10, and a sheet-turning over portion 45 for reciprocating a turning over bar 47 in the space defined by the sheet-lifting section 41 to turn over the sheet; and

a controller 50 for controlling a series of lifting, pressing and sheet-turning over processes of the bound document 10.

2. The automatic paper turning-over device  
5 according to claim 1, wherein a balance weight 25 is mounted on both sides of the supporting member 22 to promote a rotation of the supporting member 22.

3. The automatic paper turning-over device  
10 according to claim 1, wherein the sheet-lifting section 41 comprises any one of the following portions consisting of a suction portion 43 for sucking the sheet using a vacuum or an electrostatic force, and a roller portion for lifting the sheet using a friction between the sheet and the outer periphery thereof.





Fig. 1

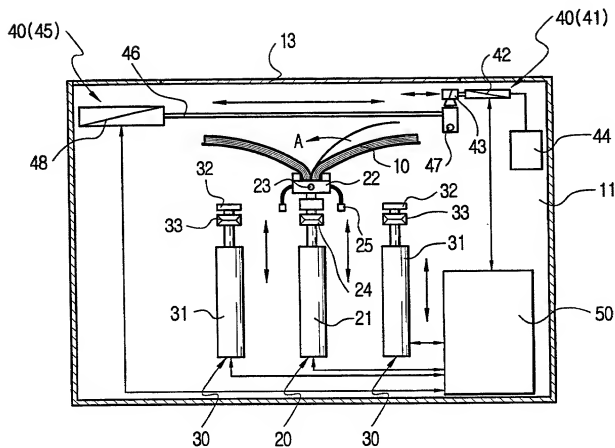


Fig. 2

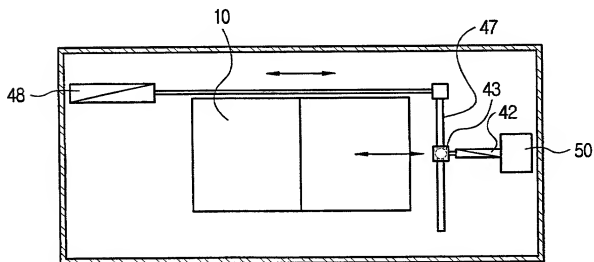


Fig. 3

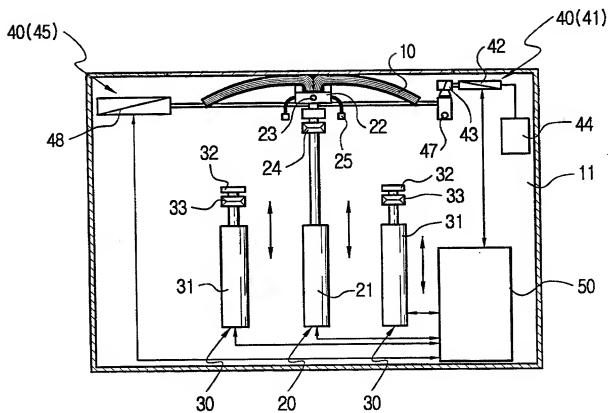


Fig. 4

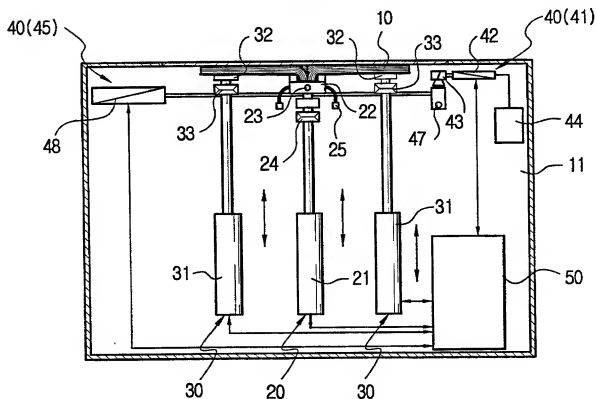


Fig. 5

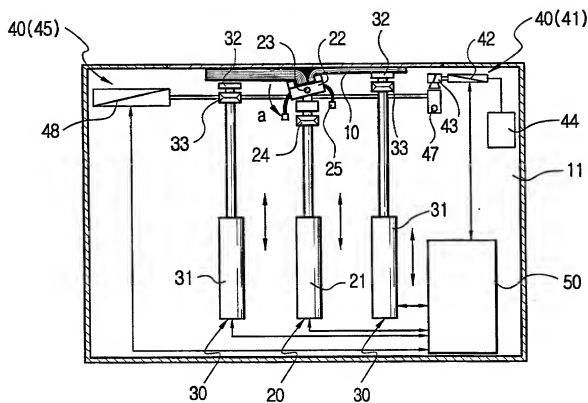
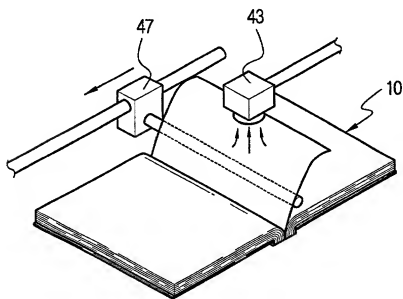


Fig. 6



## DECLARATION, POWER OF ATTORNEY AND POWER TO INSPECT

As a below named inventor, I hereby declare:

that my residence, post office address and citizenship are as stated below next to my name;

that I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the invention entitled: "AUTOMATIC PAGE TURNING-OVER FOR BOUND PAPERS"

the specification of which [check one(s) applicable]

X was filed December 7, 2001 as PCT International/U.S. Application No. 10/009,181  
 and was amended by Amendment filed \_\_\_\_\_ (if applicable); [or];  
 is attached to this Declaration, Power of Attorney and Power to Inspect;

that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above; and

that I acknowledge my duty to disclose information which is material to the examination of this application in accordance with Rule 56(a) [37CFR§1.56(a)].

**CLAIM UNDER 35 U.S.C. §119:** I hereby claim foreign priority benefits under 35 USC §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application of which priority is claimed:

Prior Foreign Application(s)		Filing Date	Priority Claimed
Application No.	Country	Day-Mo-Year	Yes - No
PCT/KR00/00485	WIPO	18 May 2000	Yes
999/22993	Korea	18 June 1999	Yes

**POWER OF ATTORNEY:** As inventor, I hereby appoint the practitioners associated with CUSTOMER NO. 000110 as my attorneys or agents with full power of substitution to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

**POWER TO INSPECT:** I hereby give DANN, DORFMAN, HERRELL AND SKILLMAN, P.C. of Philadelphia, PA or its duly accredited representatives power to inspect and obtain copies of the papers on file relating to this application.

**SEND CORRESPONDENCE TO:** CUSTOMER NO. 000110

**DIRECT INQUIRIES TO:** JOHN B. BERRYHILL, Ph.D., J.D., Reg. No. 36,452

**TELEPHONE:** (215) 563-4100

**FACSIMILE:** (215) 563-4044

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

## SOLE OR FIRST JOINT INVENTOR

## SECOND JOINT INVENTOR (if any)

Full Name HA Young-Kyun  
 First Middle Last

Full Name \_\_\_\_\_  
 First Middle Last

Signature Young-Kyun Ha

Signature \_\_\_\_\_

Date 01/31/2002

Date \_\_\_\_\_

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 City State or country

Residence \_\_\_\_\_  
 City State or Country

Citizenship Republic of Korea

Citizenship \_\_\_\_\_

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Seoul 100-250, Republic of Korea

City State or Country Zip Code

City State or Country Zip Code